with which he, even their own author, accepts such startling speculations concerning the hereditary nature of the parasitic diseases of plants.

In the matter of the potato disease, Mr. Smith gives a history of the whole subject, and a full description of the oospores, which he claims to be those of the *Phytophthora*. At p. 340 there is a sentence of some interest in view of the above-mentioned theory.

" It is quite possible, then, that just as every atom of a mycelial thread of this fungus (potato fungus) will continue its growth to a perfect form, so every atom of a broken-up flagellum—perfectly invisible to the eyes even when the highest powers of the microscope are used—may be capable of carrying the poison and at length reproducing the perfect form of the fungus in the potato plant."

Everything is possible, but some things are undoubtedly highly improbable, and chief among these are those which we have not the slightest grounds for supposing probable. Such is the case with this speculation since (to take the flagellum only) in the first place it is not by any means certain, as the author indeed points out in the same paragraph, that a flagellum breaks up at all, and in the second it is quite unwarrantable on any known basis of fact to suppose that its fragments are endowed with any reproductive function.

Apart from such speculations, I venture to think that Mr. Smith has rendered the study of vegetable parasites a signal service in the publication of this book. Its practical uses to the farmer and the gardener are apparent, and to the student of the subject the advantage is no less, even in those cases where the author differs from the great majority of his fellow-workers, since " the case for the opposition " is as well and as strongly stated as the materials permit. The book is of practical value in this country, and it is, moreover, one which no intelligent agriculturist can afford to dispense with in these times, when farming is engaged in a struggle of such severity at so many points.   GEORGE MURRAY

OUR BOOK SHELF

How to Foretell the Weather with the Pocket Spectroscope. By F. W. Cory. (London : Chatto and Windus. 1884.)

IT is of little use putting any instrument, however simple it may look, into a student's hands, if he is not previously taught how to use it. This needful information is supplied by the handy little book now before us, showing what can be done with a direct-vision spectroscope only some 3¾ inches long.

The book commences by describing two pocket spectroscopes now in use : the " rainband spectroscope," and a newer and somewhat larger instrument, " Grace's spectroscope," which, however, is still small enough for the pocket, being only 5⅝ inches long when closed, and which has the advantage of giving a larger spectrum. Here, however, there is a most important omission, for the adaptation of a lens to focus the image of a cloud or a part of the horizon on the slit is not referred to. Instruments thus armed are far better than those of the ordinary construction for meteorological purposes, and, as made by Hilger, they are not appreciably larger. We are next told how to use the spectroscope, and a map is given (Plate 1), showing the positions of some of the lines which the student should learn to recognise in the spectrum of the sun, in order to see at once if the rainband is present or not.

On another page we find the principal rainband itself (Plate 2), which is instructive as showing the student what to look for ; but in the construction of this map a larger spectroscope, of two prisms, has been employed, so that if the student in looking for the rainband uses his pocket spectroscope, he will be somewhat disappointed. It would have been more complete if a drawing of the rainband, as seen with Grace's spectroscope, could have been given side by side with Plate 2, which shows so much of the detail.

The book concludes with letters, reprinted from the *Times*, from the Astronomer-Royal for Scotland and others, showing the value of the spectroscope for meteorological purposes.

We think no one can lay down this little volume without feeling this opinion confirmed, and that in the pocket spectroscope we possess an invaluable instrument with which to forecast the state of the weather.   B.

Celestial Motion : A Handy Book of Astronomy. By W. T. Lynn. (London : Stanford, 1884.)

MR. LYNN'S long training at the Royal Observatory has eminently qualified him to write this little book. It is in no sense a school-book, but all the same it contains a most useful introduction to those parts of the science of astronomy of which it treats. These are the earth, sun, and moon ; the planets arranged in three groups ; comets, meteoroids, and the fixed stars. There is added a very painstaking and concise history of astronomical discovery, the only blot in which is an ineffective reference to spectrum analysis at the end.

The First Six Books of the Elements of Euclid, and Props. i.—xxi. of Book xi., and an Appendix on the Cylinder, Sphere, Cone, &c. With copious Annotations and numerous Exercises. By John Casey, LL.D., F.R.S. (Dublin : Hodges, Figgis, and Co., 1884.)

THIS is the second edition of a work which so accomplished a geometer as Prof. Henrici (vol. xxix. p. 453) has pronounced in these columns to be in many respects an " excellent " book. As the first edition contained 254 pages, and this one reaches 312 pages, it is manifest that the work has grown—and with its growth we find that it has acquired an accession of strength. We will indicate in what directions it has increased. First and foremost is the addition of the propositions of Euclid's Eleventh Book, which are generally read by junior students, and an appendix (well suited for candidates for the London Intermediate Examination) on the properties of the prism, pyramids, cylinder, sphere, and cone. There is also now given an explanation of the ratio of incommensurable quantities, and a still greater number, than in the first edition, of alternative proofs. Further, we can testify, by a careful perusal of the text, that the work has been " thoroughly revised as well as greatly enlarged." One feature we note, that whereas in the first edition the *syllabus* of the Association for the Improvement of Geometrical Teaching was often referred to by quotation, in this edition the name occurs but once or twice. There are reasons for most actions—we presume there are for this course of action.

We are glad to note that Dr. Casey makes frequent use of the term *right* line ; the absence of the word " right " is liable to lead young boys astray : we should also prefer in one or two instances the term " circumference " (the line) to the term " circle."

Numerous easily rectified clerical mistakes occur, and we could wish that the author had uniformly written *A B* for a line drawn from *A* to *B* instead of apparently writing the letters haphazard. The terms *area* and *perimeter* are employed without definition ; a work by Prof. Townsend (p. 142) is referred to without giving exact reference ; and an examination question (p. 173) in-

volves an acquaintance with Gauss's discoveries in regular polygons without the information having been given to the student. The proofs of i. 9 and iii. 35 appear to us to admit of improvement, the first by the familiar addition of "on side remote," &c., and the latter might advantageously be curtailed. These are small faults in a work of such extent, and we instance them to show how little we find not to our liking in an admirable text-book. We notice that Dr. Casey has adopted the convenient terms "circum-circle," "circum-centre," &c., first introduced, we believe, by W. H. H. H. in these columns. He also calls a certain well-known locus by the name of "Simson's line," following the practice now usually adopted by geometers in this country, we do not know on what authority; that well-informed writer in the *history* of the subject, Mr. J. S. Mackay, states in his edition of Euclid, recently reviewed in these columns, that he had not met with the property in Simson's writings.

Prof. Henrici in his article on "The Axioms of Geometry" (NATURE, *l.c.*) does not approve of Dr. Casey's treatment of the Fifth Book (the Algebraic), and criticises adversely Hamilton's quaternion proof of Euclid i. 32, given by our author in an appendix (cf. also NATURE, vol. xxix. p. 573). Dr. Casey prints the article as in the first edition, and takes no notice of the criticisms we refer to. A very large and well-selected collection of exercises (upwards of 800 we think), with the addition (now) of numerous examination questions, complete a work every way worthy of the reputation of the great Irish geometer.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*
[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

The Sky-Glows

ON reading Prof. Herschel's letter in NATURE for October 2 (p. 536), in which he so vividly describes the sunset of Sept. 20, I was so forcibly reminded by its similarity, especially with regard to the "diverging beams," to one which I lately witnessed during an excursion to the White Mountains (New Hampshire), that I send you a short account of it. It occurred on the evening of September 9 while we were staying at Twin Mount House, at a short distance from which is an elevated wooden erection, commanding splendid views of the neighbourhood. We had been watching the shadows creeping over the hills, the evening light reflected on a bend in the river below, had seen the sun go down behind the soft gray outlines of Mount Agassiz, and revelled in the glorious tints, such as Prof. Herschel describes, when, on returning to the hotel and stepping out on the balcony to take a last look, we saw, from the point where the sun had lately disappeared and where the fiery glow still lingered, these remarkable "diverging rays," so distinct in their character and so sombre in their dark (though slightly greenish) shadow-like hue—there were not many of them—that I involuntarily exclaimed that I had never seen anything like them before, and that surely the climate must have something to do with their striking appearance and unusual definition. I may mention that the day-glow was also conspicuous at times on that continent, notably at Quebec on August 25 last.

Since writing the above, I find that your correspondent, Mr. J. E. Clarke (September 18, p. 488), also refers to dark bars at sunrise and sunset, and the radiating character of the latter.

Further Barton, Cirencester, October 17   E. BROWN

THAT Mr. Backhouse is right in thinking the day-glows were entirely fresh in November of last year, the following extract from my diary confirms. As ordinary meteorological phenomena are entered upon a daily chart, my note-book only refers to what is unusual. Those whom I called to notice the sky thought it quite strange. "1883, xi. 25.—SKY COLOURING at 2.45 to 3 p.m. of a pale rosy-pink tint to the blue, giving a greenish-gray cast to cirro-cumuli where it shone through. Formed circle round sun extending from about 10° to 25° or 30° away. Inside the 10° sky yellowish. Can this have anything to do with the green sun seen in India, and therefore with the Java eruptions? Have noticed once or twice of late unusual sunset-colouring *very* late. At 4.30 strange ruddy or bright red tint on brick houses in Bootham. At 5.30 the west ruddy, as from glare of fire; still signs visible of this up to six. Sunset at Greenwich at 3.58; therefore here at 3.38. Notice also various newspaper reports and also in NATURE of striking appearances after sunset, ascribed to auroras, &c."   J. EDMUND CLARK

Bootham, York, October 19

Cole's Pits

IN reference to the subject of the "Cole's Pits," respecting which a notice from Mr. A. Irving appeared in NATURE for Oct. 9 (p. 560), I find that as early as 1784 these pits, or rather perhaps some of them, were investigated by the Hon. Danes Barrington. And a paper appears on the views entertained by him regarding them in *Archæologia*, vol. vii. p. 236, under the head of "An Account of Certain Remarkable Pits, or Caverns, in Berkshire." Although Mr. Barrington expresses some doubts as to his conclusions, he nevertheless leans to the opinion that they are the winter dwellings of a pre-Roman people, the entire series constituting perhaps an ancient British town. He estimates them at about 273 in number, and covering a space of about 14 acres. In depth they vary from 7 to 22 feet, and are 40 feet and upwards in diameter, the largest being not in all instances the deepest. They extend in regular series, and are placed rather closely to each other. They are referred to a period anterior to that of Stonehenge; and it is conjectured that if each pit contained five occupants the entire community would have numbered something like a population of 1400 souls. As suitable for the residence of uncivilised people stress is laid on the fact that the place is entirely of the dried sand on the rich vale of the White Horse. The dwellings are supposed to have been entered by climbing down a rude ladder or notched pole after the manner adopted by the natives of Kamchatka in reaching their underground habitations. It is remarkable as bearing on the theory that these pits are abandoned quarries, that no objects, such as pottery, indicative that they (the pits) were used as dwellings, were found by Mr. Barrington. There can be no doubt that the pits are simply the sites of shafts dug for the purpose of obtaining the underlying ironstone. Indeed, Mr. Godwin-Austen appears to have set the matter at rest many years ago; and although I am not able at the moment to state in what paper on the subject the opinion occurs, I am in possession of a note in which Mr. Godwin-Austen, with the keen perception of the skilled geologist, observes that although "the Faringdon tradition points this spot out as the site of the castle of King Cole, whose memory is preserved in a well-known fragment of popular poetry, geology can countenance no fictions except its own, and Cole's Pits are evidently the remains of the open workings for the ironstone underlying the mass of sand."

Reading, October 10   JOSEPH STEVENS

Circular Rainbow

THE circular rainbow mentioned by Mr. Marshall seems to be similar to what may be seen at the Niagara American Falls by persons who are fortunate enough to have taken the trip under a portion of that Fall at the right time. When coming out into the front of the Fall, if the sun be shining and in a favourable position, each observer is surrounded by a rainbow of which his eye is the centre, and which accompanies him while in front of the Fall like the halo of a saint of old, but larger.

Before railroad days, when travelling by coach from Bristol to Bridgwater, I once saw a complete circular rainbow resting on the vale below the Leigh Woods, just out of Bristol.

Barnstaple, October 20   W. SYMONS

P.S.—One morning, as the sun was rising over the Southern Atlantic, the sea being moderately rough, I saw each white crested wave drowned with the prismatic colours, causing a dancing play of glorious colour never to be forgotten.